

EXHIBIT A

We Claim:

1. A network device operable to:

generate and send a backward path request message to a source of a separately generated, initial forward path request message associated with a forward Label Switched Path (LSP) between the device and the source; and

receive a backward path reservation message from the source in order to establish a backward LSP between the device and the source, wherein the separately generated forward and backward LSPs form a bi-directional LSP between the device and the source.
2. The device as in claim 1 further operable to generate and send an initial, forward path reservation message to the source in order to establish the forward LSP after receiving the initial forward path request message.
3. The device as in claim 1 further operable to generate and send a backward path reservation message to a destination after receiving a backward path request message from the destination in order to establish a backward LSP between the device and the destination.
4. The device as in claim 3 further operable to separately generate and send a forward path request message to the destination in order to establish a forward LSP between the device and the destination, wherein the separately generated forward and backward LSPs between the device and the destination form a bi-directional LSP between the device and the destination.
5. The device as in claim 1 wherein the forward and backward LSPs between the device and source comprise the same path.
6. The device as in claim 4 wherein the forward and backward LSPs between the device and destination comprise the same path.
7. The device as in claim 1 further operable to generate the backward path request message based on backward path parameters contained in the initial forward path request message.
8. The device as in claim 7 further operable to generate the backward path request message based on routing information contained within the parameters.
9. The device as in claim 7 further operable to query a local database to obtain routing information in order to generate the backward path request message when routing information is not contained within the parameters.

10. The device as in claim 7 further operable to generate the backward path request message based on a quality-of-service (QoS) indicator contained within the parameters.

11. The device as in claim 7 further operable to generate the backward path request message based on best effort routing information when a QoS indicator is not contained within the parameters.

12. The device as in claim 7 wherein the traffic parameters comprise parameters selected from the group consisting of a bi-directional LSP indicator, QoS indicator and routing information.

13. The device as in claim 1 further operable to request backward traffic parameters from the source when the initial path request message does not contain such parameters.

14. The device as in claim 1 further operable to generate and send a first delete path message to the source and to receive a second delete path message from the source in order to delete the bi-directional LSP.

15. The device as in claim 14 further operable to send the first delete path message to the source before receiving the second delete path message from the source.

16. The device as in claim 14 further operable to send the first delete path message to the source after receiving the second delete path message from the source.

17. A network device operable to generate and send a backward path reservation message to a destination after receiving a backward path request message from the destination in order to establish a backward LSP between the device and the destination.

18. The device as in claim 17 further operable to separately generate and send a forward path request message to the destination in order to establish a forward LSP between the device and the destination, wherein the separately generated forward and backward LSPs between the device and the destination form a bi-directional LSP between the device and the destination.

19. The device as in claim 18 wherein the forward and backward LSPs between the device and destination comprise the same path.

20. The device as in claim 17 further operable to generate and send a first delete path message to the destination and to receive a second delete path message from the destination in order to delete the bi-directional LSP.

21. The device as in claim 20 further operable to send the first delete path message to the destination before receiving the second delete path message from the destination.

22. The device as in claim 20 further operable to send the first delete path message to the destination after receiving the second delete path message from the destination.

23. A method for creating a bi-directional LSP comprising the steps of:

generating and sending a backward path request message to a source of a

separately generated, initial forward path request message associated with a forward Label

Switched Path (LSP) between the device and the source; and

receiving a backward path reservation message from the source in order to

establish a backward LSP between the device and the source, wherein the separately generated

forward and backward LSPs form a bi-directional LSP between the device and the source.
24. The method as in claim 23 further comprising the steps of generating and sending
an initial, forward path reservation message to the source in order to establish the forward LSP
after receiving the initial forward path request message.
25. The method as in claim 23 further comprising the steps of generating and sending
a backward path reservation message to a destination after receiving a backward path request
message from the destination in order to establish a backward LSP between the device and the
destination.
26. The method as in claim 25 further comprising the steps of separately generating
and sending a forward path request message to the destination in order to establish a forward LSP
between the device and the destination, wherein the separately generated forward and backward
LSPs between the device and the destination form a bi-directional LSP between the device and
the destination.
27. The method as in claim 23 wherein the forward and backward LSPs between the
device and source comprise the same path.
28. The method as in claim 26 wherein the forward and backward LSPs between the
device and destination comprise the same path.
29. The method as in claim 23 further comprising the step of generating the backward
path request message based on backward path parameters contained in the initial forward path
request message.
30. The method as in claim 29 further comprising the step of generating the backward
path request message based on routing information contained within the parameters.
31. The method as in claim 29 further comprising the step of querying a local
database to obtain routing information in order to generate the backward path request message
when routing information is not contained within the parameters.

32. The method as in claim 29 further comprising the step of generating the backward path request message based on a quality-of-service (QoS) indicator contained within the parameters.

33. The method as in claim 29 further comprising the step of generating the backward path request message based on best effort routing information when a QoS indicator is not contained within the parameters.

34. The method as in claim 29 wherein the traffic parameters comprise parameters selected from the group consisting of a bi-directional LSP indicator, QoS indicator and routing information.

35. The method as in claim 23 further comprising the step of requesting backward traffic parameters from the source when the initial path request message does not contain such parameters.

36. The method as in claim 23 further comprising the steps of generating and sending a first delete path message to the source and receiving a second delete path message from the source in order to delete the bi-directional LSP.

37. The method as in claim 36 further comprising the step of sending the first delete path message to the source before receiving the second delete path message from the source.

38. The method as in claim 36 further comprising the step of sending the first delete path message to the source after receiving the second delete path message from the source.

39. A method for creating a bi-directional LSP comprising the steps of generating and sending a backward path reservation message to a destination after receiving a backward path request message from the destination in order to establish a backward LSP between the device and the destination.

40. The method as in claim 39 further comprising the steps of separately generating and sending a forward path request message to the destination in order to establish a forward LSP between the device and the destination, wherein the separately generated forward and backward LSPs between the device and the destination form a bi-directional LSP between the device and the destination.

41. The method as in claim 40 wherein the forward and backward LSPs between the device and destination comprise the same path.

42. The method as in claim 39 further comprises the steps of generating and sending a first delete path message to the destination and to receive a second delete path message from the destination in order to delete the bi-directional LSP.

43. The method as in claim 42 further comprising the step of sending the first delete path message to the destination before receiving the second delete path message from the destination.

44. The method as in claim 42 further comprising the step of sending the first delete path message to the destination after receiving the second delete path message from the destination.

45. A network device comprising:
means for generating and sending a backward path request message to a source of a separately generated, initial forward path request message associated with a forward Label Switched Path (LSP) between the device and the source; and

means for receiving a backward path reservation message from the source in order to establish a backward LSP between the device and the source, wherein the separately generated forward and backward LSPs form a bi-directional LSP between the device and the source.

46. The device as in claim 45 further comprising means for generating and sending an initial, forward path reservation message to the source in order to establish the forward LSP after receiving the initial forward path request message.

47. The device as in claim 45 further comprising means for generating and sending a backward path reservation message to a destination after receiving a backward path request message from the destination in order to establish a backward LSP between the device and the destination.

48. The device as in claim 47 further comprising means for separately generating and sending a forward path request message to the destination in order to establish a forward LSP between the device and the destination, wherein the separately generated forward and backward LSPs between the device and the destination form a bi-directional LSP between the device and the destination.

49. The device as in claim 45 wherein the forward and backward LSPs between the device and source comprise the same path.

50. The device as in claim 45 wherein the forward and backward LSPs between the device and destination comprise the same path.

51. The device as in claim 45 further comprising means for generating the backward path request message based on backward path parameters contained in the initial forward path request message.

52. The device as in claim 51 further comprising means for generating the backward path request message based on routing information contained within the parameters.

53. The device as in claim 51 further comprising means for querying a local database to obtain routing information in order to generate the backward path request message when routing information is not contained within the parameters.

54. The device as in claim 51 further comprising means for generating the backward path request message based on a quality-of-service (QoS) indicator contained within the parameters.

55. A network device comprising means for generating and sending a backward path reservation message to a destination after receiving a backward path request message from the destination in order to establish a backward LSP between the device and the destination.

56. The device as in claim 55 further comprising means for separately generating and sending a forward path request message to the destination in order to establish a forward LSP between the device and the destination, wherein the separately generated forward and backward LSPs between the device and the destination form a bi-directional LSP between the device and the destination.